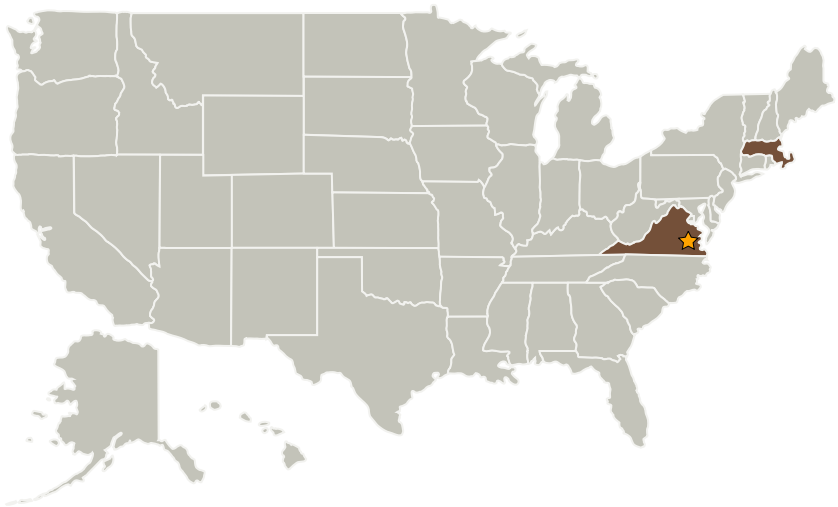
Crew Cerebral Oxygen Monitor, Phase II

Completed Technology Project (2004 - 2006)

Project Introduction

This Phase II SBIR proposal is aimed at developing a non-invasive, optical method for monitoring crew member state of awareness in operational environments. All active devices used in this monitoring system will consist of commercially available components. Continuous monitoring of the mental state of personnel engaged in critical activities could provide a means of protection against human performance lapses resulting from unforeseen circumstances. If a deterioration of the state of awareness of an individual can be detected before that individual's performance is affected, serious accidents or lapses in operator performance could be avoided. A computer-controlled four-wavelength breadboard cerebral oxygen monitor was designed, fabricated, and demonstrated during Phase I. Using phantoms with controlled blood-oxygenation levels, high sensitivity and motion artifact rejection by proper algorithm use was demonstrated. Based on these successful Phase I results, Phase II will miniaturize the system size to a wearable format, and optimize the system performance. The new cerebral oxygen monitor performance will be evaluated, and more refined algorithms to eliminate motion artifacts will be developed. A portable, prototype version of this crew cerebral oxygen monitor will be designed, fabricated, evaluated, and delivered to NASA at the completion of the program.

Primary U.S. Work Locations and Key Partners



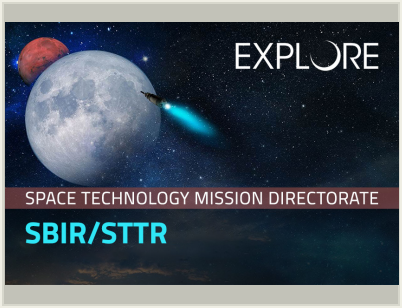


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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Spire Corporation	Supporting Organization	Industry	Bedford, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.3 Informatics and Decision Support Systems